IOT BASED COAL MINE SAFETY SYTEM USE BY IOT

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ABSTRACT

Safety is the most crucial component of any form of industry. In the mining business safety and security is a vital part of all. To avoid all types of accidents mining sector adopts several basic measures. Still accidents take place in underground mines because to growth in temperature and methane gas leaking. Here we provide safety to worker. When worker in danger he might hit emergency switch inform security. To promote safety in underground mines, a reliable communication system must be built between workers in subterranean mines and fixed ground mine system. The communication network must not be interrupted at any moment and in any condition. A cost-effective wireless mine supervision system with early-warning intelligence is offered in this project. Worker status can be observed over IOT.

1. INTRODUCTION

Explosions frequently occur in mines, making them the most hazardous workplace in the world. Each year, thousands of individuals lose their lives as a result of mining accidents. According to a recent study, 12,000 individuals have perished in mine accidents on average. When digging in coal mines, diggers are putting their lives at risk, and occasionally they lose their lives. Coal is a non-sustainable source that can't be replaced by humans, and there have been several incidents of coalmine accidents in the mines. The old equipment and wired devices, which result in mishandling, spillage of the noxious gases in the coal mines, pose enormous hazards to the excavators inside the coal mines. As a result, we've devised a coalmine safety system that avoids this. We used the Thinger system to complete the analysis after testing the data collected by the sensors. This allowed us to get to the root of the problem. There are two ways to control a system: automatically and manually.

2. LITERATURE SURVEY

The MSP430-based architecture proposed by Kumar et al[1] Temperature, humidity, gas, and smoke are all monitored in the coal mine. The motor controls the climatic state of a Zigbee transceiver located in the heart of the system. For communication purposes, Zigbee is used. Lihui et al[2] created a system that collects temperature, humidity, and methane values from sensor nodes and processes the data. To keep workers safe, an SMS will be sent if any esteem rises above normal. Using temperature, humidity, and carbon dioxide levels, Madhu et al[4] created a coal mine safety monitoring system. GSM is used to communicate with the forest and fire agencies in the event of an uncertain situation. According to Ashish et al [5,] an ARM controller and several sensors, such as a temperature sensor, humidity sensor, and gas sensor, comprise a system. Monitor conditions in the mine with an IR sensor. Coal mine gas concentrations can be monitored using a technique proposed by Wakode et al[6]. The systems are designed to inform miners in the event of an emergency, which might save their lives. In the event of an emergency, an alert switch is located on both the transceivers and receivers. When Aarti et al constructed a system for monitoring temperature, humidity and methane levels at a mining site using an ARM9 processor, they used a Wi-Fi module to send all of the data back to the web page. By storing and visualising the data of all parameters that are monitored in a cloud, Dheerajet al[8] proposed a framework to ensure the safety of coal mine workers. Coal Mine safety monitoring based on Zigbee and GPRS remote transmission was proposed by Dong et al. [9]. It is now possible to send and receive information from afar using GPRS technology, and the short message sent to his cell phone serves as a way to keep him aware of the latest developments in coal mining safety.

3. PROPOSED SYSTEM

Coal mine identification of dangers. In order to complete the project, the receiver and transmitter modules are needed. Heat, smoke and methane sensors are built within the transmitter module.

An LCD and an RF transmitter are also included in the transmitter module. An RF receiver, an LCD display, and a WiFi module make up the receiver module. Every two minutes, all sensor data is sent to the remote IOT server. A buzzer serves as an additional alarm in the design.
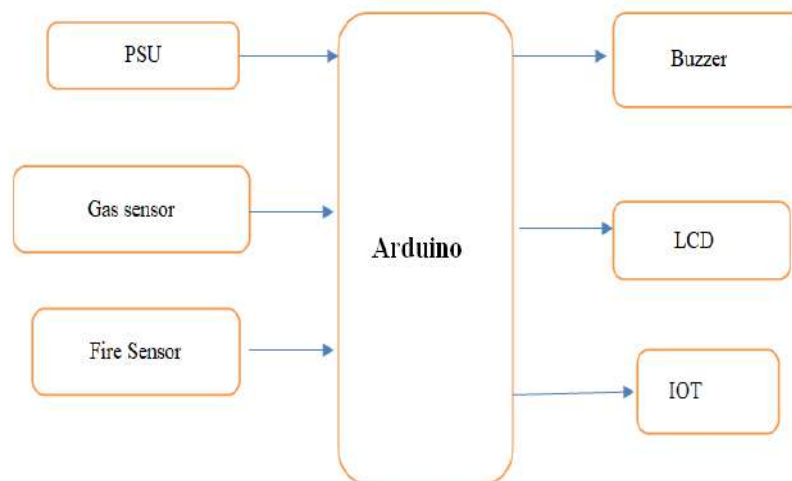

Fig 1: Block Diagram

HARDWARE
- Arduino
- Gas sensor
- Fire sensor
- PSU
- Buzzer
- IOT
- LCD

SOFTWARE
- Arduino ide
- Proteus

ADVANTAGES
- The project is built from easily available and reasonably priced components. Therefore, the cost is reasonable and maintenance is easy.
- This project is crucial in the coal mining industry and is critical for the health and safety of the mine workers.

APPLICATIONS
- The crucial parameters from inside the mine can be monitored from anywhere in the world by the supervisors and manager using the remote IOT platform. This can result in better management and improved production standards.
- This is a safety-critical project, therefore this system can be improved by making it fail-safe. We can implement the fail-safe operation using redundancy in the system. If one module fails then the parallel module will take over the operation

4. RESULTS AND DISCUSSION

CONNECTING:
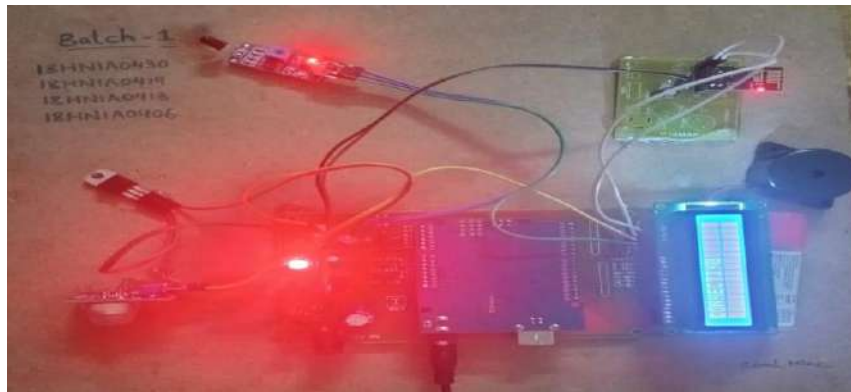
GAS DETECTED:
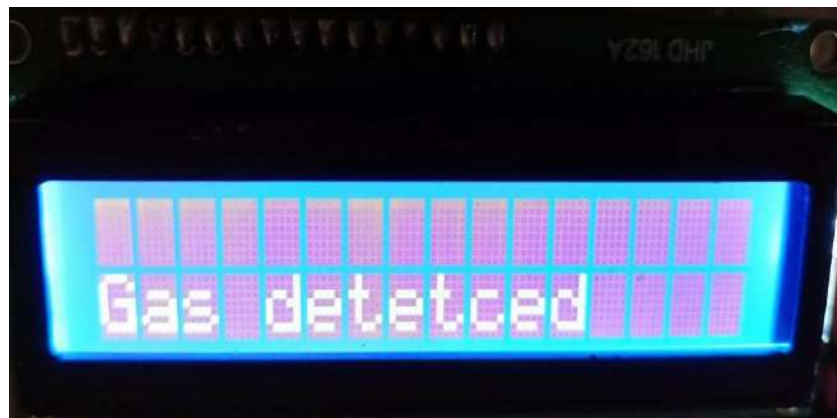
HIGH TEMPERATURE:

5. CONCLUION

In order to provide a more precise view of the underground mine, a real-time monitoring system is being created. Mine workers can use this technology to their advantage by viewing parameters on the monitoring unit, which will alert them if an accident occurs. When sensor values exceed a predetermined threshold, an alarm is set off. For future review, this method also keeps all of the data in the computer.

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